

N85-34168

Title: Electrodynamic Tether

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Short Description: The Electrodynamic Tether consists of a satellite deployed to a distance of 20 km by an electrically conducting tether. The Space Station hardware consists of a 12 meter deployment boom, satellite cradle, tether reel and motor, and other tether support systems. The Electrodynamic Tether will be used to perform a variety of wave experiments by exciting a wide spectrum of low frequency waves in the ionospheric plasma. The system can also be used to artificially generate and study field aligned currents and associated plasma effects. Hydromagnetic waves generated by the passage of the system through the space plasma are of particular interest in space plasma research.

Instrument Characteristics:

Mass: 2600 kgm (includes 500 kgm for satellite)
Volume: 8 cubic meters (includes 1 cubic meter for satellite)
Power: 1.6 kW (1.5 kW for peak operation of the deployer operating for up to 10 hours for each deployment)
Data rate: 64 Kbs
Campaign period: 6 days

General Comments:

Early versions of the Electrodynamic Tether will be flown on STS missions beginning in the late 1980s. It is expected that the tether will also be flown in the "atmospheric mode" before 1990, where a 100 km tether will be deployed down (earthward from the STS).

The tether mission will be a part of the STO "campaign mode" wherein the tether is deployed for one week per month (average), and then retrieved.

Servicing of the satellite is expected to be required after every retrieval.

Items to be serviced include the satellite batteries and gas for satellite thrusters. The tether material should be routinely inspected for material degradation.

Data will be through Space Station.

Source of Information: TSS Project Documents

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